Credible Software Cost Estimates

Software Development Cost Estimating Handbook

Systems & Software Technology Conference

21 April 2009

Purpose of Briefing

- **Introduce handbook**
- **Approach, structure, and format**
- **Brief explanation of four parts, ten sections, and appendices**
- **Future plans**
- **How to obtain a copy**

Roles and Responsibilities

- **Software Technology Support Center (STSC), Hill AFB, UT**
  - Researching
  - Blueprinting
  - Technical writing
  - Internal reviewing/editing
- **Naval Center for Cost Analysis (NCCA), Arlington, VA**
  - Funding
  - Technical advising
  - Technical reviewing
- **Air Force Cost Analysis Agency (AFCAA), Arlington, VA**
  - Funding
  - Technical advising
- **CrossTalk (STSC), Hill AFB, UT**
  - Editorial reviewing

Timeline of Key Events

- **Feb 98:** **Publication of original Software Handbook**
- **Mar 05:** **Coordinated agreement for new volume**
- **Aug 05:** **Kick-off of revision efforts**
- **Mar 07:** **Redirection on format/style**
- **Oct 07:** **Second redirection on format/style**
- **Feb 08:** **Handbook status briefed at DoDCAS**
- **Apr 08:** **Independent technical review**
- **Jul 08:** **CrossTalk editorial reviews**
- **Aug 08:** **NCCA technical review**
- **Sep 08:** **Completion of final draft revision**
- **1st Qtr 09:** **"Beta Test" of handbook**
- **Jan 09:** **Release/posting of final revised handbook**

42 Month "Labor of Love"

Handbook Purposes

Basic   *Advanced*   *Reference*

Estimating Basics

- **Software Development Process**
- **Estimating process**
  - System level
  - Component level
- **Details**
  - Size
  - Productivity
  - Developer capability
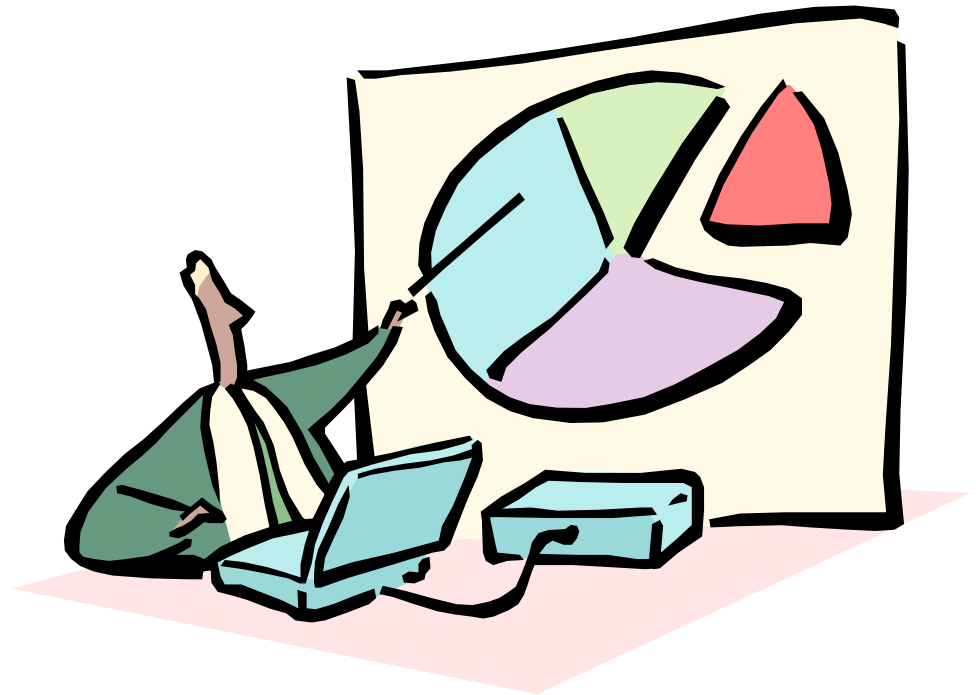 - Environment
  - Product characteristics
- **Reality check**

In Depth Information

- **Procedural steps**
- **Case studies**
  - System level
  - Component level
- **Guidelines**
  - Practical
  - Historical, analogous
- **Effort allocation**
  - Development
  - Maintenance

Resources Provided

- **Software development processes**
- **Software estimating models**
- **Defense Acquisition Framework**
- **Data collection**
- **Acronyms**
- **Terminology**
- **References**

Handbook Structure

- **Four main parts**
  - Basics
  - Estimating process
  - Estimating details
  - Appendices
- **Format**
  - Textbook style
  - Designed for readability and comprehension
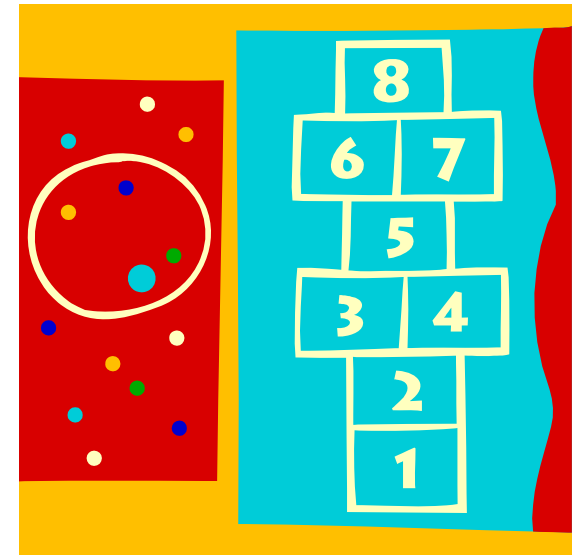 - Large right margin for notes

Part I - Basics

- **Introduction**
  - Handbook overview
  - Software development and estimating principles
  - Key concepts
- **Software development process**
  - Background information
  - General understanding level
  - Effects of acquisition phase on estimate
  - Software engineering considerations

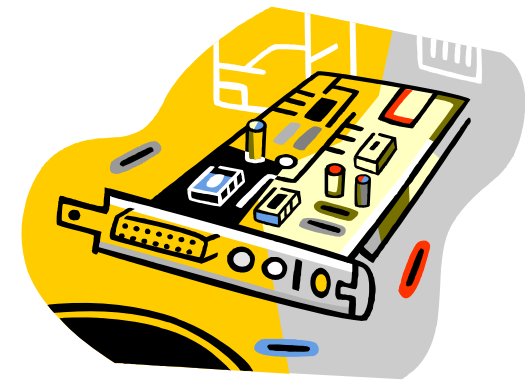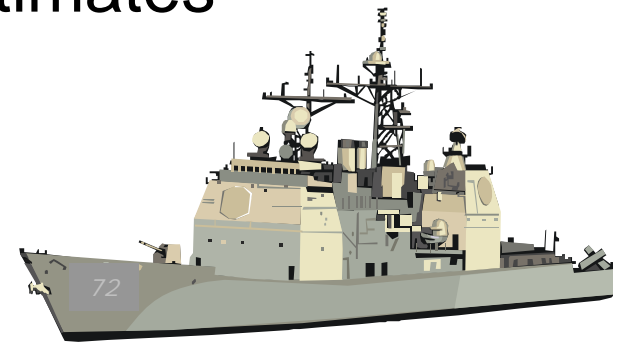# Part II – Estimating Process

- **Software estimate types**
  - System- and Component-level estimates
  - Controlling factors
- **System-level estimating**
  - Early in acquisition process
  - Details not available or final
  - Productivity constant and effective size
- **Component-level estimating**
  - Detailed product information
  - Defined environment
  - Cost and schedule estimates

Part III – Estimating Details

- **Effective size**
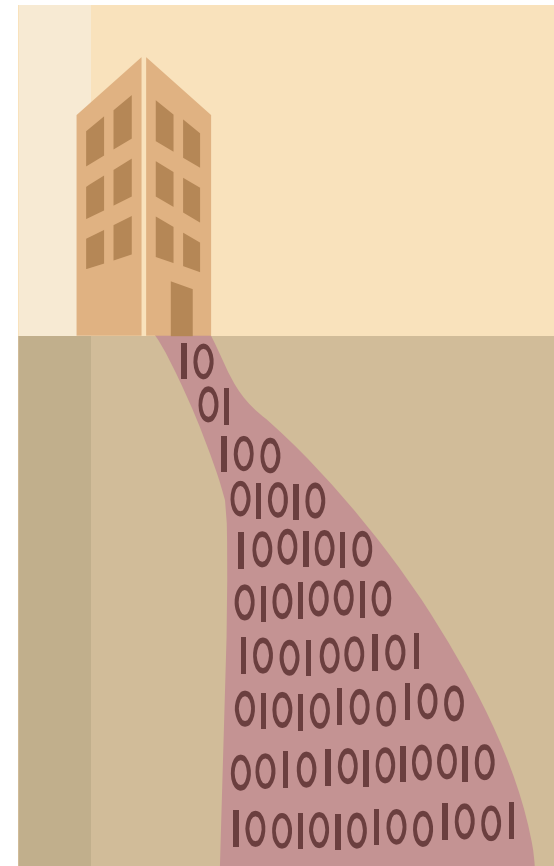 - Source Lines Of Code (SLOC)
  - Function Points
- **Productivity**
  - Product type
  - Developer characteristics
- **Developer capability**
- **Development environment**
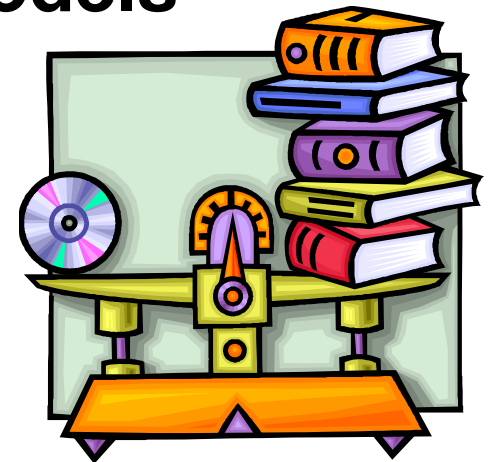- **Product characteristics**
  - Complexity
  - Constraints

Appendices A - E

- **Appendix A: Acronyms**
- **Appendix B: Terminology**
- **Appendix C: Bibliography (References)**
- **Appendix D: Software Life Cycle Approaches**
  - Traditional
  - Other
- **Appendix E: Software Estimating Models**
  - Analogy
  - Expert Judgment
  - Bottom-up
  - Parametric
  - First, Second, and Third Order

Appendices F - G

Appendix F/G: System-Level/Component-Level Estimate Case Study

- Detailed examples
- Step-by-step approach
- Baseline size
- Code growth
- Productivity
- Effort (cost) and schedule
- Maintenance
- Nominal and worst case
- Reality check
- Effort allocation

Appendices H - I

- **Appendix H: The Defense Acquisition System**
  - Definitions
  - Defense Acquisition Framework
    - Activities
    - Phases
  - References/Resources
- **Appendix I: Data Collection**
  - Generic collection template
  - Validation
  - Normalization
  - Use in models

Future Revisions

- **Living, growing document**
  - Corrections
  - Updates (notionally every 12-16 months)
  - Research
    - DCARC
    - Auto-Gen code
  - Abridged version
- **Next Phase**

  - Automated Information Systems
  - Enterprise Resource Planning (ERP) programs

Handbook and Survey Locations

- **NCCA online library**
    - http://www.ncca.navy.mil/library/library.cfm
- **STSC website**
    - http://www.stsc.hill.af.mil
- **Handbook Survey**
    - Comments on current version and recommendations for future enhancements
    - Available at SSTC in hard copy or on NCCA and STSC's web-sites

Questions